BOOK REVIEWS.

Plane Geometry. By JOHN H. WILLIAMS and KENNETH P. WILLIAMS. Lyons and Carnahan, Chicago, 1915. 264 pages.

At the outset an effort is made to justify the study of geometry. This is usually a vital question in the minds of young people when they undertake the subject for the first time.

Scattered through the book will be found exercises in construction, numerical problems, and original exercises. These appear as soon as theorems or definitions have been given that lead up to them. Numerical exercises and original theorems, if brought in as soon as possible, will aid materially in fixing fundamental notions without, at the same time, taking up the usual theorems too rapidly. In this respect the book is well conceived. Following the definitions of complementary and supplementary angles on page 21, is found a well-chosen list of numerical problems, also following the theorem on the "sum of the angles of a triangle" will be found appropriate numerical exercises.

At the close of each book is a review which summarizes, in concise form, the main notions of the book. This includes definitions, axioms, postulates, corollaries, theorems, etc., in question form. For example: When is one proposition the converse of another? How are triangles classified as to their sides? How are the acute angles of a right triangle related? These and many others constitute a complete summary of the first book. This book closes with the significant statement: "Name three general reasons for studying geometry."

It would seem that the field for plane geometry had been so thoroughly covered that there could be no excuse for new texts; however modern conditions and modern thought call for some changes. The school curriculum is more crowded than formerly and pupils take up the study of geometry at a somewhat earlier age; and the tendency toward the practical makes it necessary for a geometry text to justify itself from the standpoint of practicability, besides being somewhat simplified to meet these changed conditions. To hold its own with the pressing demands of other subjects, geometry must be made interesting. Variables and limits are not introduced in Book II, as is usual, but instead in Book V just before the theorems on circumference and area of circles. This arrangement seems very satisfactory; the theory of limits is needed only in connection with circles. Earlier theorems on incommensurables may with propriety be omitted.

On page 88 is found the following corollary: "The ratio of two incommensurable arcs of the same circle or of equal circles can be expressed as the ratio of two commensurable arcs to any degree of exactness, if a sufficiently small unit of measure is used;" with a note to the effect that in practice there is no distinction to be made between commensurable and incommensurable lines as the fraction to be dropped from one of two incommensurable lines to make the lines commensurable is less than the error made in the work of measuring.

On the whole this text seems well adapted to present needs and should meet with a generous response.

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New Plane Geometry. By EDWARD RUTLEDGE ROBBINS. American Book Company, New York, 1915.   264 pages.

This book is a revision of a Plane Geometry published by the same author a few years ago.   The revision, as the author suggests, is an outgrowth of the author's experience and suggestions from teachers who have used the former edition as well as from recommendations of the "National Committee of Fifteen."

While the general plan of the new book is much the same as the old, there are many additions that make the book comply with recent demands.

Each page is attractive, the material is well arranged, statements of theorems and the words *given, to prove, proof*, etc., are in italics.

Simple fundamental truths are explained instead of being formally demonstrated," as for example, "all straight angles are equal."   Several such will be found on pages 13 and 14.

No theorems are demonstrated in full.   Proofs are given in outline, reasons indicated by references.   It would seem that if a few theorems were demonstrated in full the pupil might have a more definite notion of what constitutes a complete demonstration.

Original exercises are scattered through the book in abundance.   These appear as early as possible.   After theorem (2) will be found eleven original exercises; after theorem (34), 28 exercises; after theorem (35), 11 more; and so on.

These exercises do not depend upon previous exercises for proofs, the numbered references alone being sufficient.

The large number of original exercises makes it possible to furnish the ambitious pupil with an abundance of choice material.

In all there are about 200 original exercises in Book I, especially of the theorem variety.   Very few numerical problems are to be found in this book; possibly a number of such problems would have been an advantage.

Book II is unusually attractive.   Definitions are well illustrated.   A large number of original exercises are found in this book.   These must be seen to be appreciated.

At the close of Book III will be found a collection of 69 exercises (numerical). These involve the application of a large number of theorems of every description. These exercises are followed by 53 original theorems, and these by 43 original constructions.

At intervals are historical notes which help to interest the pupil in the subject.

Summaries found on pages 68, 94, and 180 classify the theorems in a way that will be helpful for reference purposes.